

AUGMENTED VISUALIZER FOR REAL TIME DATA THROUGH VIRTUAL REALITY IN AUTOMATION AND CONTROL OVER INTERNET

Anuja.T¹ Ashwini.M², Ignatius Benisha.C³, Mohana Priya.G⁴,

Assistant Professor, Information Technology, Jeppiaar Engineering College, Tamilnadu, India

Student, Information Technology, Jeppiaar Engineering College, Tamilnadu, India

Student, Information Technology, Jeppiaar Engineering College, Tamil Nadu, India

Student, Information Technology, Jeppiaar Engineering College, Tamilnadu, India

ABSTRACT

Augmented Reality is an most amazing experience where we could interact with real world they are been grown in a far manner because of computer perceptual. There are three major features to enhance the properties of Augmented Virtualization first one combining real and virtual world, second one is interaction and the last one is accurate 3 D registration .It can also be Constructive and Destructive where constructive stands for additional to the environment and Destructive stands for masking up The main difference between augmented reality and virtual reality is in augmented reality is one which replace the users real world whereas augmented reality is one which alters one real world environment.

Keywords: *virtual reality, augmented visualizer, automation*

1. INTRODUCTION:

Augmented Reality is use to enhance the natural surrounding with the help of AR technology the information about the real world user become interactive and digitally manipulated it is an greatest experience that is artificial and which adds to the existing reality. Augmented Reality plays a important role gathering and sharing knowledge .These techniques are performed in real world and it is seen in environmental elements Augmented Reality mostly uses a technique called HUD- Heads-Up Display Technology from the word augmented reality which is actually real but add layers of the virtual object to the real environment on the other hand VR the surroundings environment is completely virtual . The best example of VR and AR is in architecture VR can be used to walk through stimulation inside the building but AR used to show the building structures and systems superimposed on real life view.

2. LITERATURE SURVEY:

This literature review is a broad and clear overview of the use of VR .Within the social education context ,it gives an more clear sophisticated analysis into the present and near -future of VR To minimize the size and scope of a paper with such a overwhelming amount of literature on this subject it was been published in the year 2020

Augmented Reality technologies , this 3D model interaction technology have received widespread attention from academy and enabling technology it is been published in 2021

In this project the Augmented Reality works on the basic of movements which is done by us it is made in the platform called Unity

3. EXISTING SYSTEM

Voice commands are accustomed to prompt different activities, from delivering news reports and playing music, to setting timers and checking train times further as saving you time, they might also prevent money by keeping your house energy efficient and secure. Recently, smart speakers become commercially common operation methods for controlling home appliances, and that they have solved a number of the issues with remote operations. It is difficult to use voice recognition during a noisy environment. additionally, it takes a extended time to test this current status of home appliances because users should ask their smart speakers questions or give commands and accept for answers. To research other remote operation methods. SSVEP (Steady State Visually Evoked Potential) protocol is been employed in current smart speaker designs. Its a variety of support between 3.5Hz to 75Hz which in turns directly matches with the neural frequency that potentially spoil sensory organs.

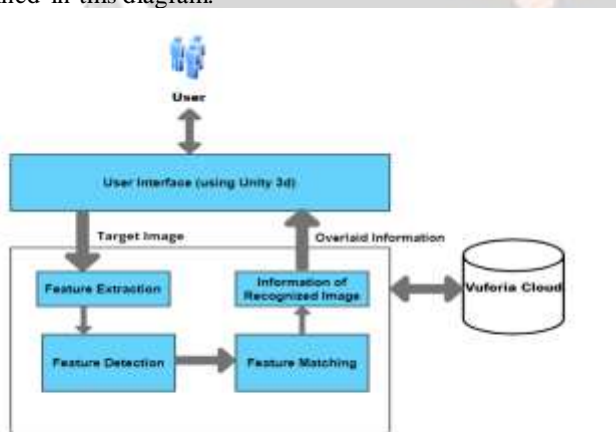
4. PROPOSED SYSTEM

In our proposed system we use AR as the mode of virtual communication. Everyone prefers less messy additionally as user friendly interface and hence we are moving towards augmented reality in home automation. AR allows a virtual appear whenever the user points his/her camera towards the item to be controlled or the switch. Focusing AR, a software development kit (SDK) are visiting be required.

It provides automatic file generation and Application build configuration . Thus we'll build our very own AR app which enables reflection mounted over real time camera image which allows the user to determine on ON/OFF option when the camera of the smart device is pointed towards the thing. AR uses the concept of image tracking, processing and communicating to manage the applications.

5. SYSTEM ARCHITECTURE

This diagram is nothing but a simple description of all the entities that have been incorporated into the system. The diagram represents the relations between each of them and involves a sequence of decision-making processes and steps. You can simply call it a visual or the whole process and its implementation. All functional correspondences are explained in this diagram.



**Fig 1.1 ARCHITECTURE DIAGRAM
WORKFLOW DIAGRAM**

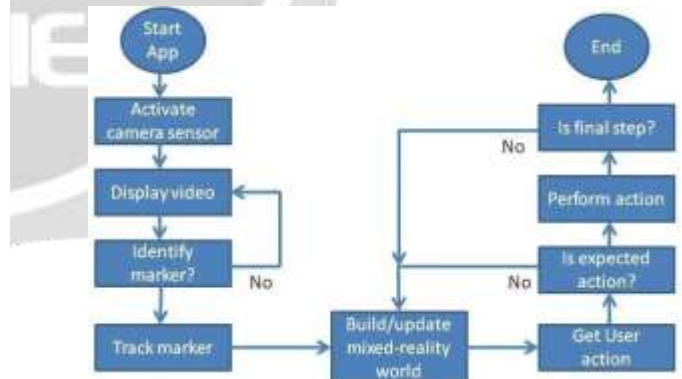


Fig 1.2

6. MODULAR DESCRIPTION

6.1 3D UNITY

Unity is the most popular gaming engine used by developers all over the world, and for good reason. It has a powerful visual interface for creating games, and also cross-platform development and a vibrant community of collaborators.

- Unity 3D's window is made up of small individual windows that can be rearranged, grouped in sets, detached from one location and docked back to the main window.

Unity is the most popular game enabler in the world. This has a host of features and is flexible enough to create almost any game you can consider of.

Because the C# coding API and made Visual Studio integration, programmers adore it. Unity also does provide JavaScript as a scripting language and MonoDevelop as an IDE as alternatives to Visual Studio.

Artists, on the other foot, adore it because it will include powerful animation tools that make it simple to create your own 3D cutscenes or build 2D animations from scratch. In Unity, anything can be animated.

Unity 3D includes a multitude of professional tools for both programmers and artists.

6.1.2 ANDROID STUDIO

Android Studio is Google's official integrated development environment (IDE), built on JetBrains' IntelliJ IDEA software and designed specifically for Android development.

- Android Studio supports all of the programming languages supported by IntelliJ (and CLion), including Java, C++, and others with extensions, such as Go.

6.1.3 VUFORIA

- Vuforia is a mobile augmented reality software development kit (SDK) that allows the development of augmented reality applications.

- With this image registration capability, developers can position and orient virtual objects, such as 3D models and other media, in relation to real-world objects when viewed through a mobile device's camera.

- The Vuforia SDK supports a wide range of 2D and 3D target types, such as 'markerless' Image Targets, 3D Model Targets, and a type of addressable Fiducial Marker known as a VuMark.

- As an extension to the Unity game engine, Vuforia provides Application Programming Interfaces (API) in C++, Java, Objective-C++, and .NET. It recognises and tracks planar images and 3D objects in real time using computer vision technology.

6.1.4 BLYNK

Blynk was designed for the web of Things. It controls hardware remotely, it can display sensor data, and store data, visualize it and do many other things. There are three major components within the platform:

Blynk App - It allows you to create interfaces for your projects using various widgets provided.

Blynk Server - guilty for all the communications between the smartphone and hardware. you can use our Blynk Cloud or locally run your private Blynk server. Its open-source, could easily handle thousands of devices and might even be launched on a Raspberry Pi.

Blynk Libraries - for the popular hardware platforms - enables communication with the server and process all the incoming and out coming commands.

Now imagine: on every occasion you press a Button within the Blynk app, the message travels to space the Blynk Cloud, where it magically finds its because of your hardware. It works the identical within the incorrect way and everything happens during a blink of a watch.

6.1.5 MARKER IDENTIFICATION:

A marker is an image (it could be anything) that can be uniquely identified and not be confused with other images because it will be the portal through which virtual elements can be brought into the real world. The application is designed to recognise the marker in any scene and provide information about its location and orientation. The following steps are taken to recognise a marker:

- Input
- Conversion to Grayscale
- Thresholding

6.2 ALGORITHM:

6.2.1 IMAGE RECOGNITION:

The software must derive planet coordinates, independent of camera, and camera images. That process is named image recognition, and uses different methods of computer vision, mostly associated with video tracking. Markers are visual cues which trigger the display of the virtual information. a chunk of paper with some distinct geometries will be used. The camera recognizes the geometries by identifying specific points within the drawing.

6.2.2 FEATURE EXTRACTION:

It consists of two parts. the first stage is to detect interest points, fiducial markers or optical flow within the camera images. It uses detection methods like corner detection, blob detection, edge detection or thresholding, and other image processing methods. The second stage restores a real-world organization from the knowledge obtained within the primary stage. Some methods assume objects with known geometry (or fiducial markers) are present within the frame. in an exceedingly very number of these cases the scene 3D structure should be calculated beforehand. If a component of the scene is unknown simultaneous localization and mapping (SLAM) can map relative positions. If no information about scene geometry is out there, structure from motion methods like bundle adjustment are used. Mathematical methods employed within the second stage include: projective (epi polar) geometry, geometric algebra, rotation representation with exponential map, Kalman and particle filters, nonlinear optimization, robust statistics. To recognize a marker, the next steps are followed:

1. Input: The onboard camera or the camera connected to the system captures the image. it's either captured as live still image or as a video, preferably a video is used so the input is then call processing further down the steps.
2. Grayscale Conversion: The input frame is completed within the intensity plane so converted to the grayscale. Input of an android phone is given in RGB format then it's converted into grayscale.
3. Thresholding: After this the image is converted into binary image so as that a binary image component analysis could even be performed. Two varieties of threshold is used for the conversion: Adaptive Threshold and Global Threshold

7. CONCLUSION

A common result from several studies is that AR applications can enhance the learning process and motivation and effectiveness. Despite the positive results, more research is vital. this work aims to review the degree of diffusion of AR technology and teachers' opinion about the need for continuous training, the tactic of creating 3D models, and also the feasibility of AR applications development by teachers and students at college settings. Teachers are the common element in every different educational system and play a key role within the combination and acceptance of technology in education.

Qualitative research was conducted in February 2019 in rural and suburban areas of North-Western Greece on education teachers of varied specialties and also the results showed that AR applications development is feasible

under certain conditions, including the limitation of the curriculum because the most negative factor and so the teacher's personality and also the need for cooperation among teachers of varied specialties as positive factors.

7.1 FUTURE ENHANCEMENT

Augmented Reality and computer game market incorporates a potential to succeed in 151 Billion USD with a paramount CAGR of 70.4% by 2022 (Source: Markets and Markets). It is true that the AR and VR technologies have driven the gaming and industry, but it also features a excellent potential to rework the healthcare industry since it actually can change plenty of traditional healthcare operations and branches during a number of how, including radiology, oncology, training, and more.

Still being at a really early stage, digital reality (AR/VR) technologies are helping supply specialists to save lots of life and take critical decisions. Considering this potential of VR/AR, healthcare may revolutionize the way diagnostic practice is disbursed to look at MRI and CT images. Let's discuss diagnostic imaging in oncology. However, there's an unlimited potential for AR and VR applications within the medical imaging across its different stages namely detection, diagnosis and treatment.

7.2 RESULT OUTPUTS



Fig 2.1 Hardware setup



Fig 2.2 AR Target Image



Fig 2.3 Android app output



Fig 2.4 Mobile Blynk User Interface

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